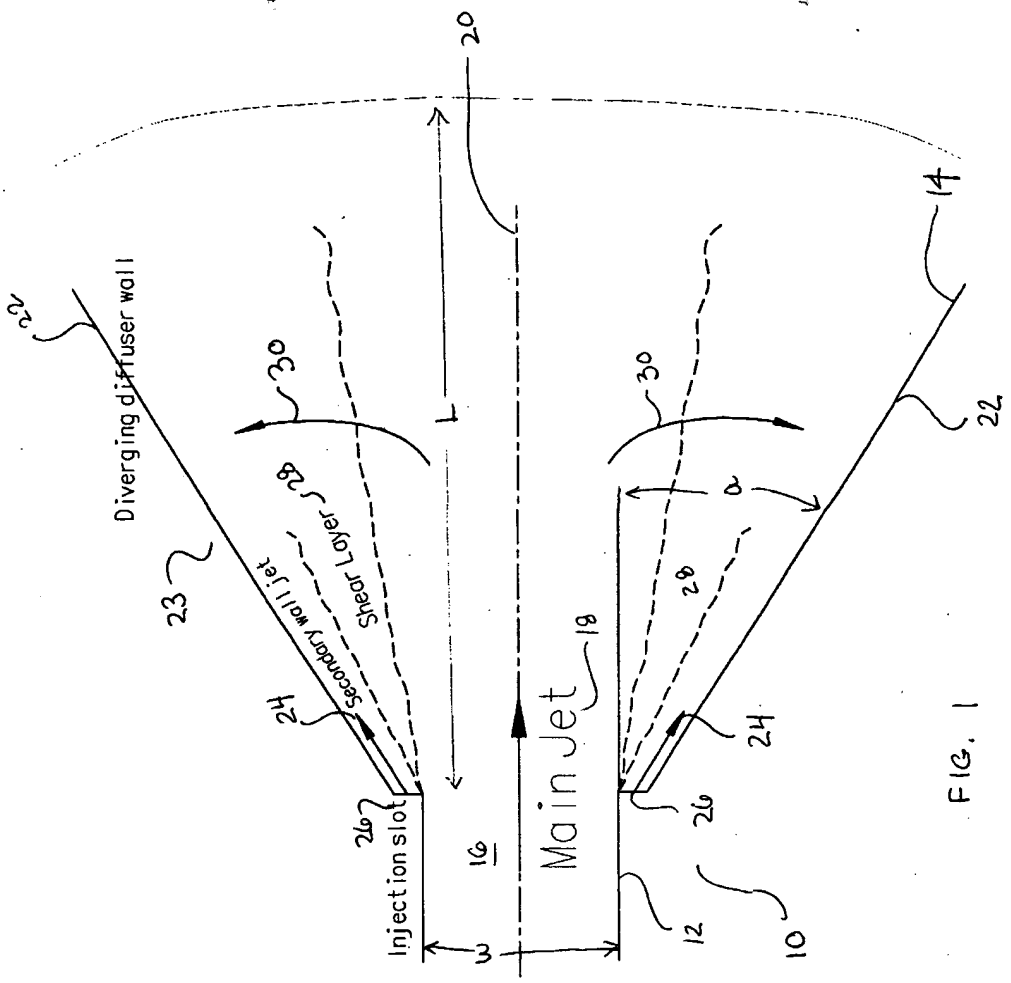

20
Diverging diffuser wall
22
23
30
28
Shear Layer
Secondary wall jet
24
26
Injection slot
16
Main Jet
18
L
d
D
12
10
14

FIG. 1

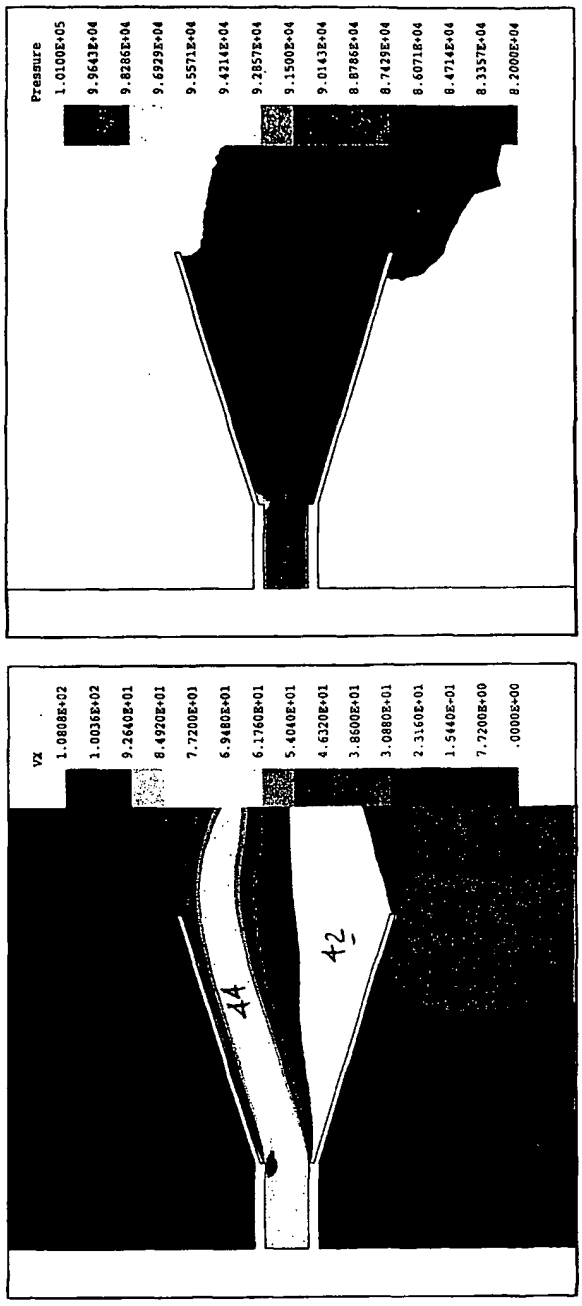


FIG. 2

BEST AVAILABLE COPY

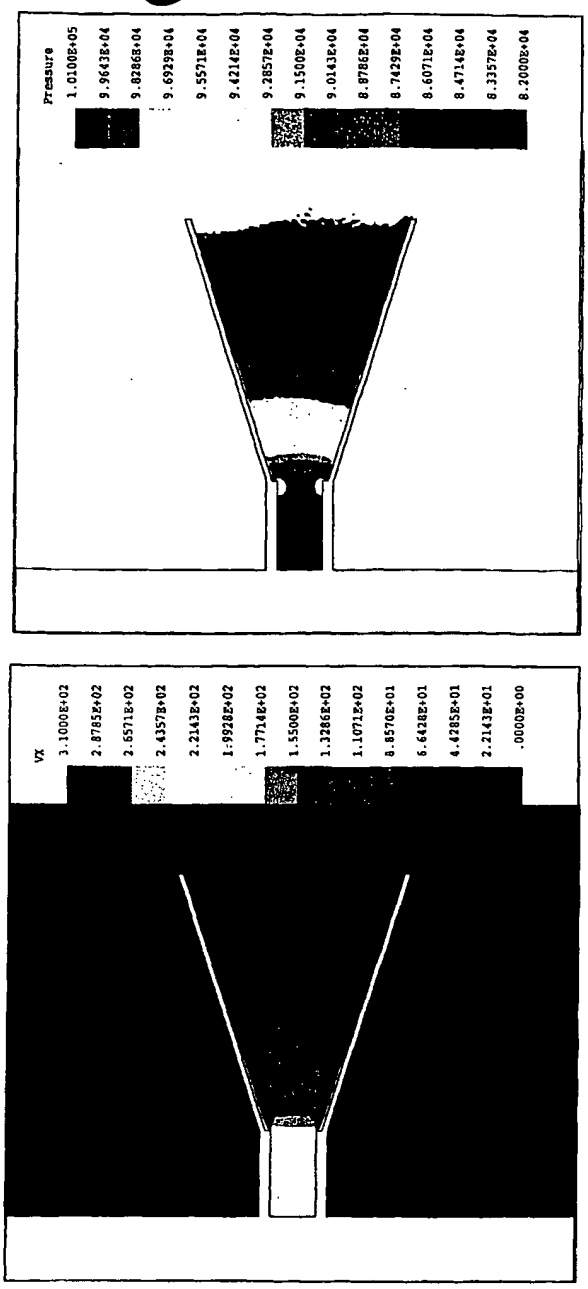


FIG. 3

BEST AVAILABLE COPY

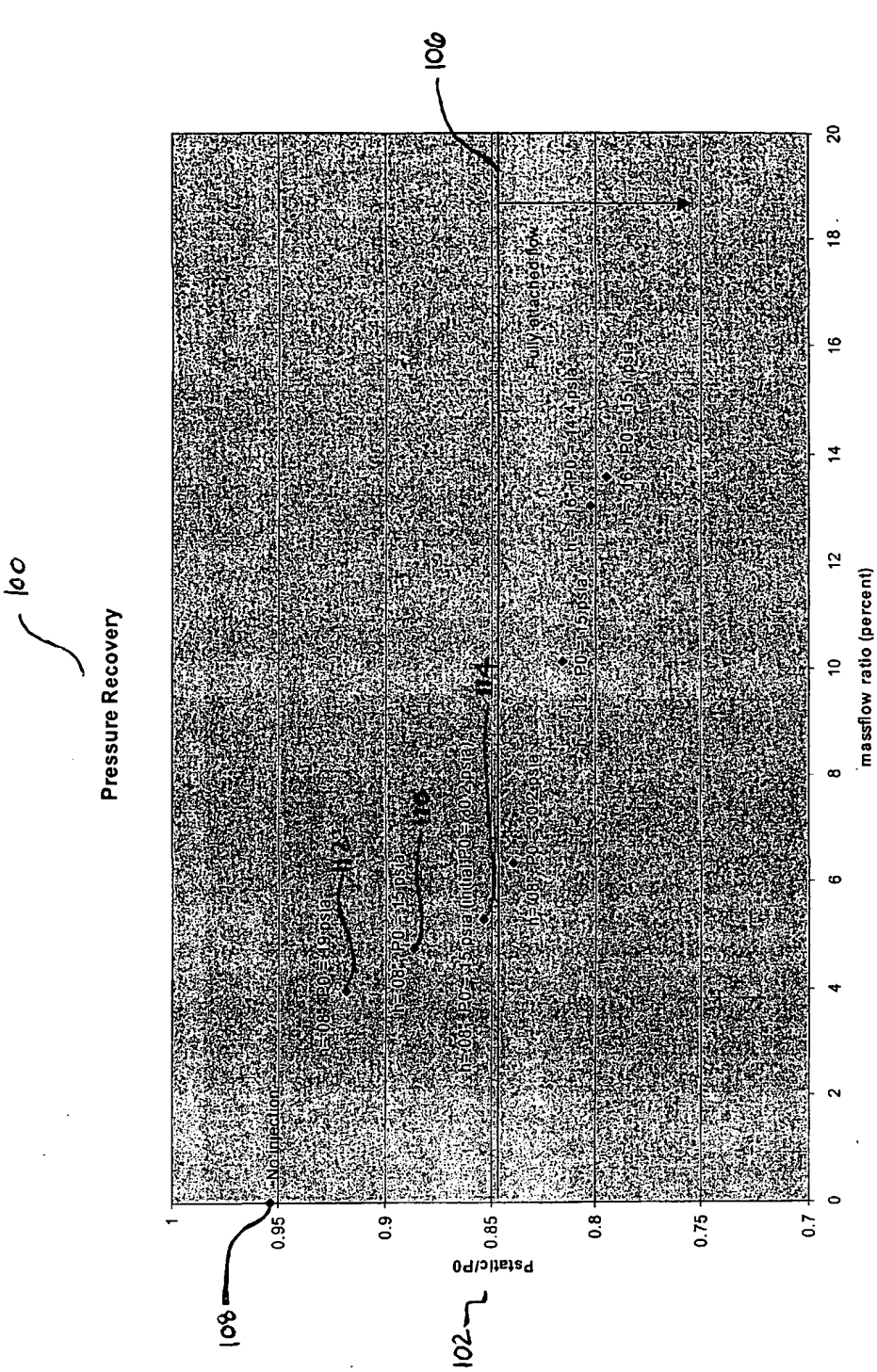


FIG. 4

BEST AVAILABLE COPY

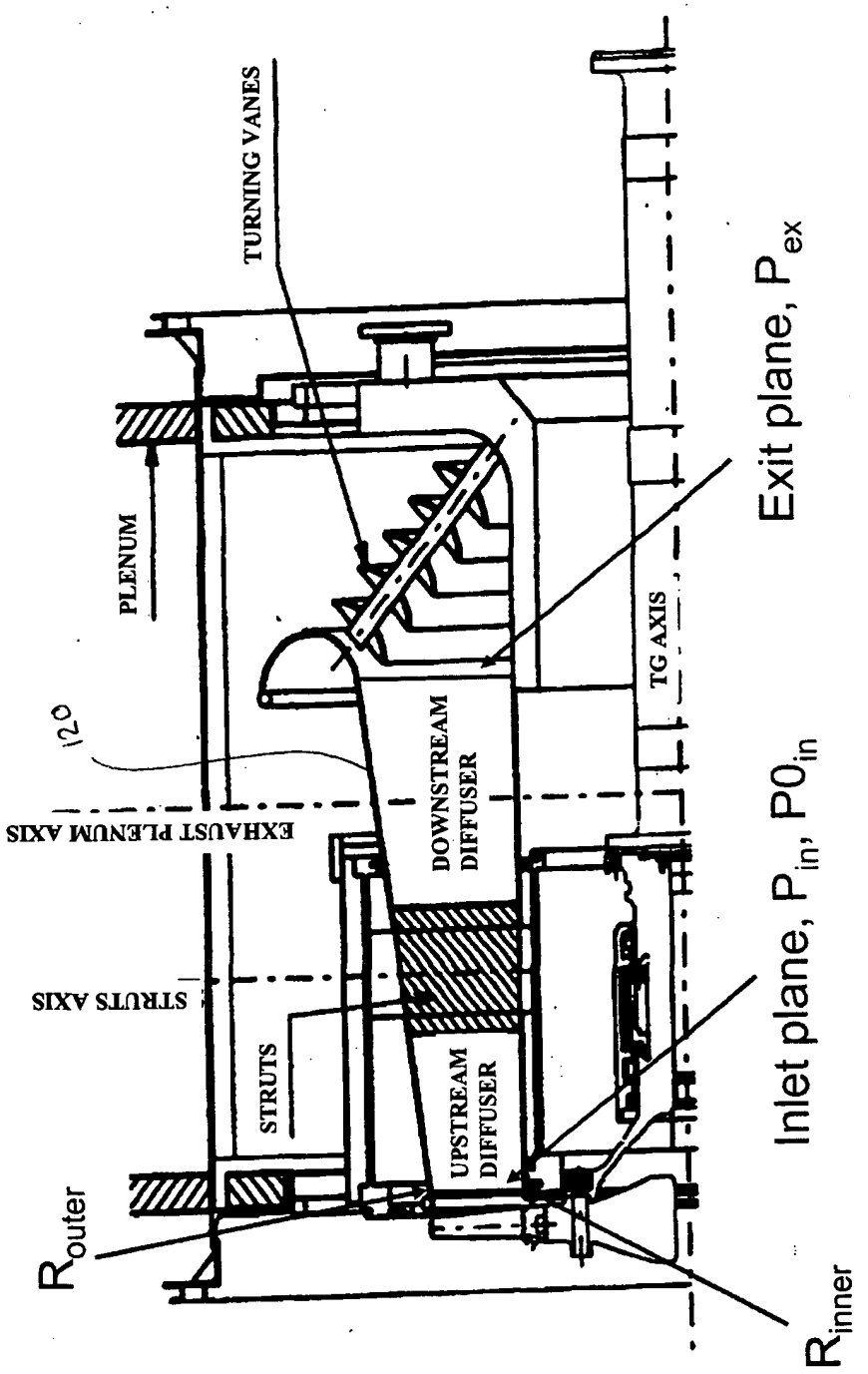


FIG. 5

BEST AVAILABLE COPY

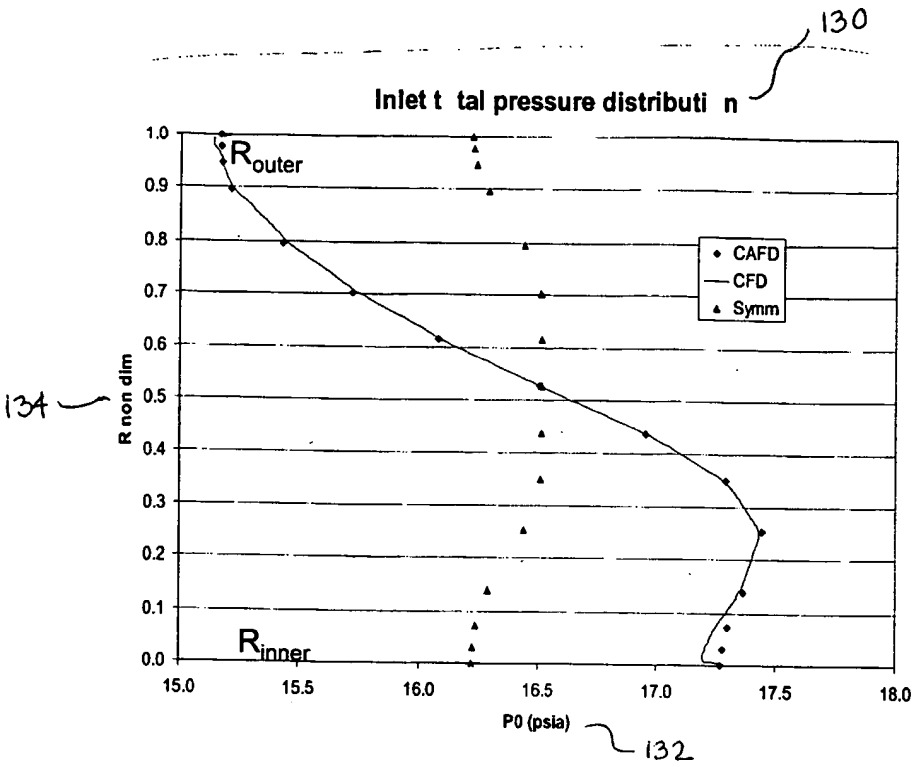


FIG. 6

BEST AVAILABLE COPY

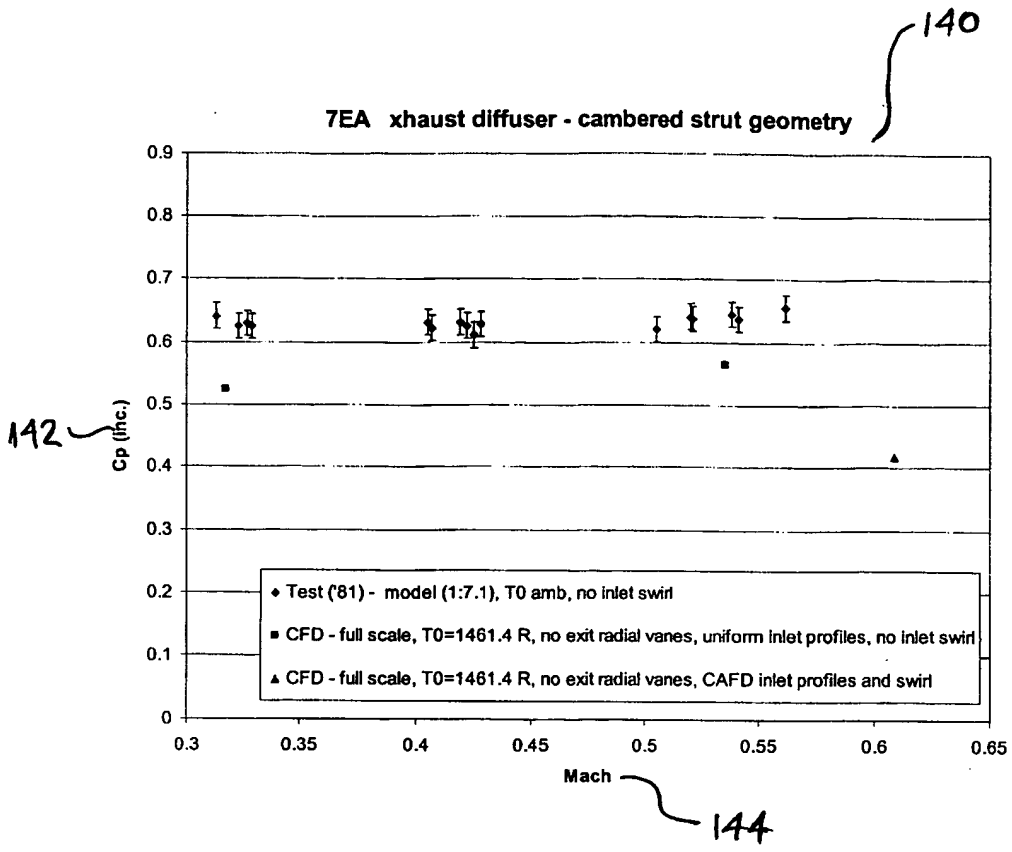


FIG. 7

BEST AVAILABLE COPY

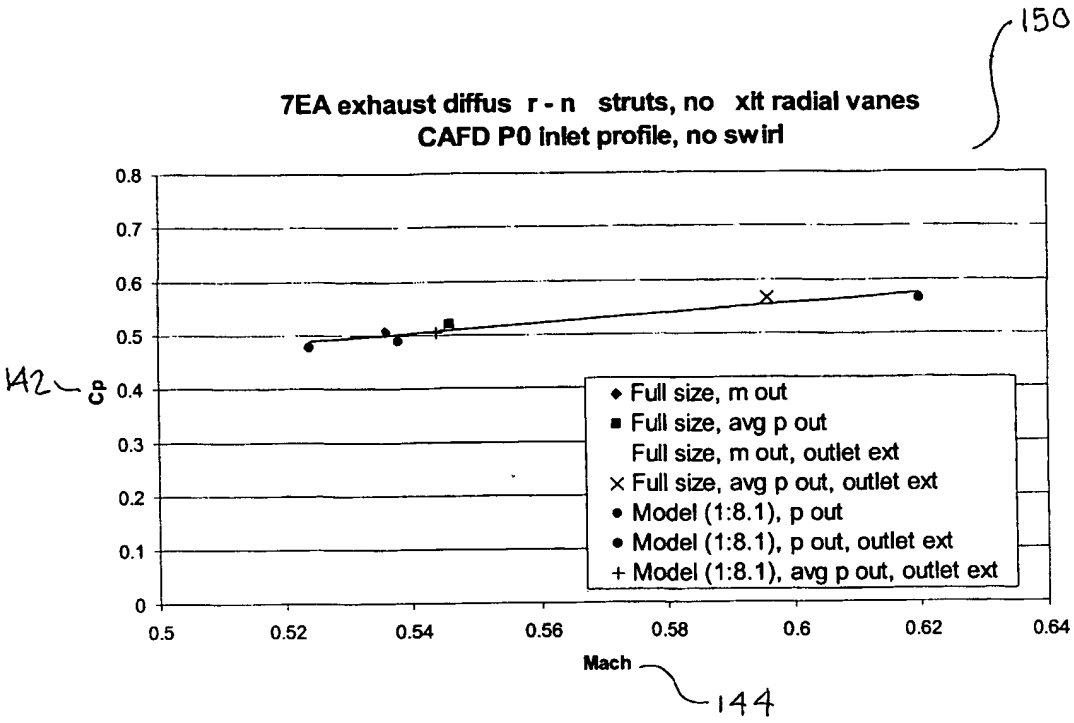


FIG. 8

BEST AVAILABLE COPY

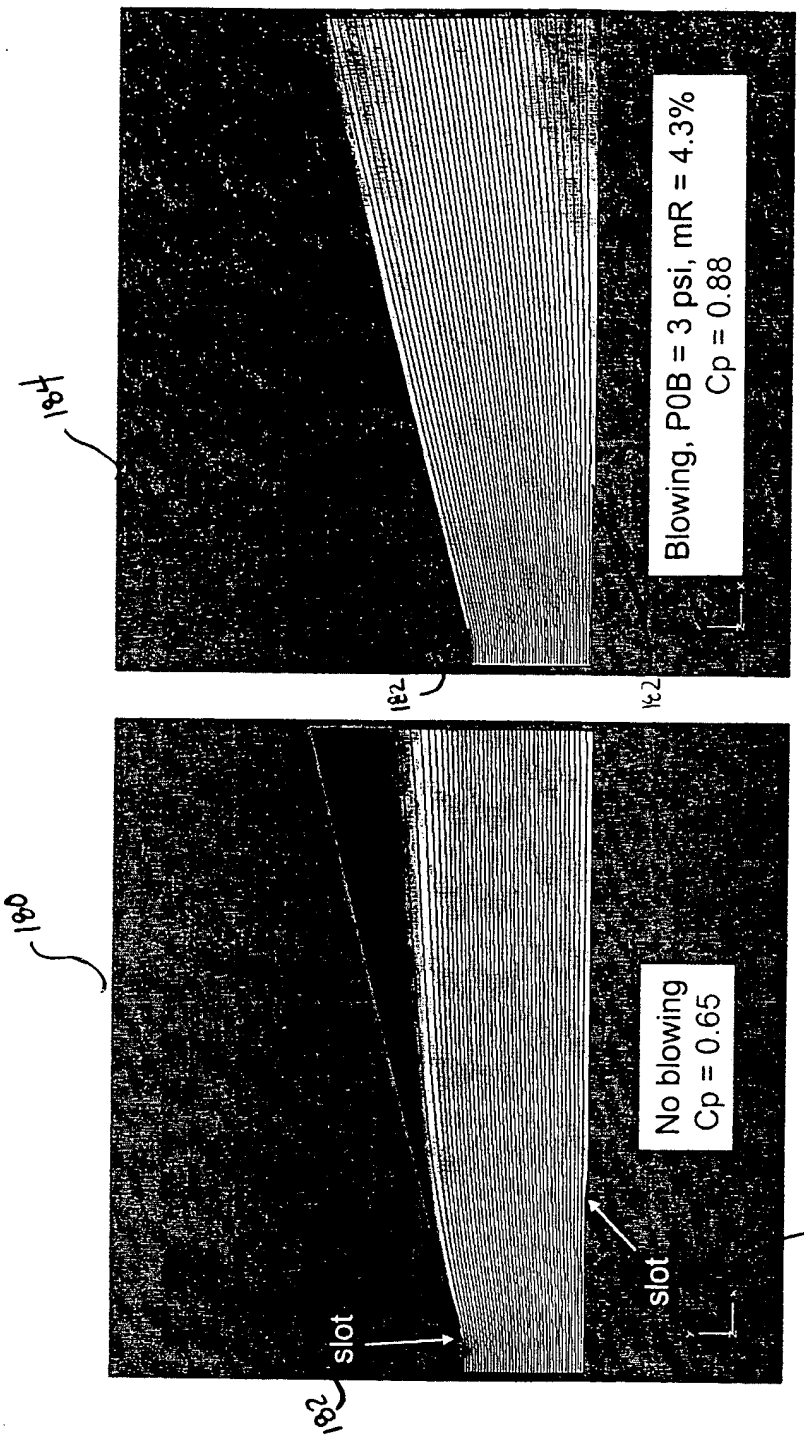


FIG. 9

BEST AVAILABLE COPY

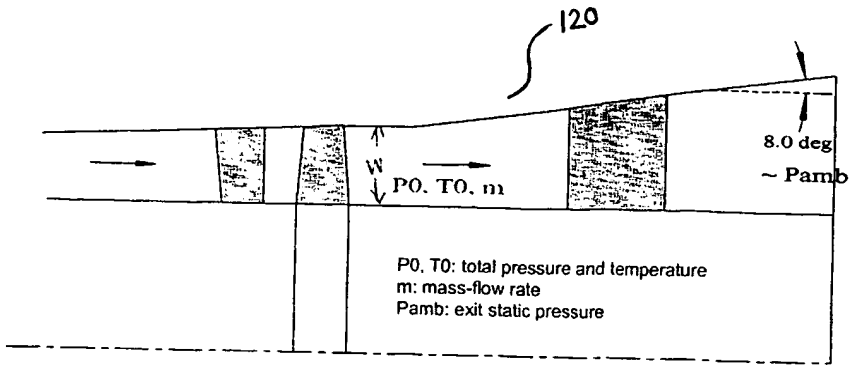


FIG. 10

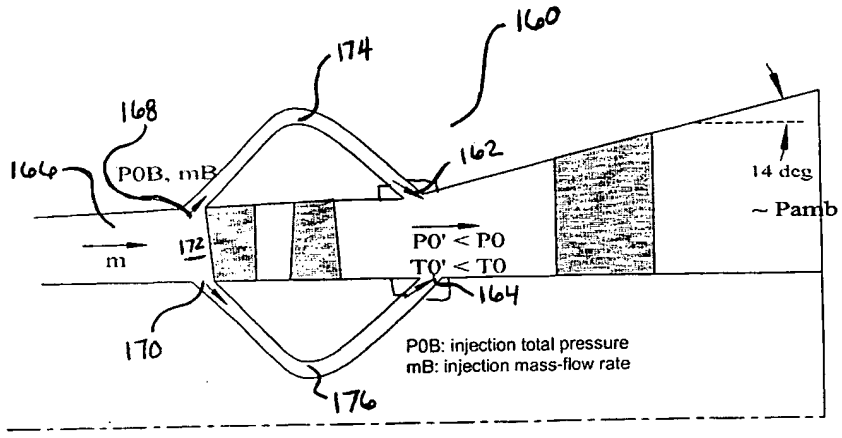


FIG. 11

BEST AVAILABLE COPY

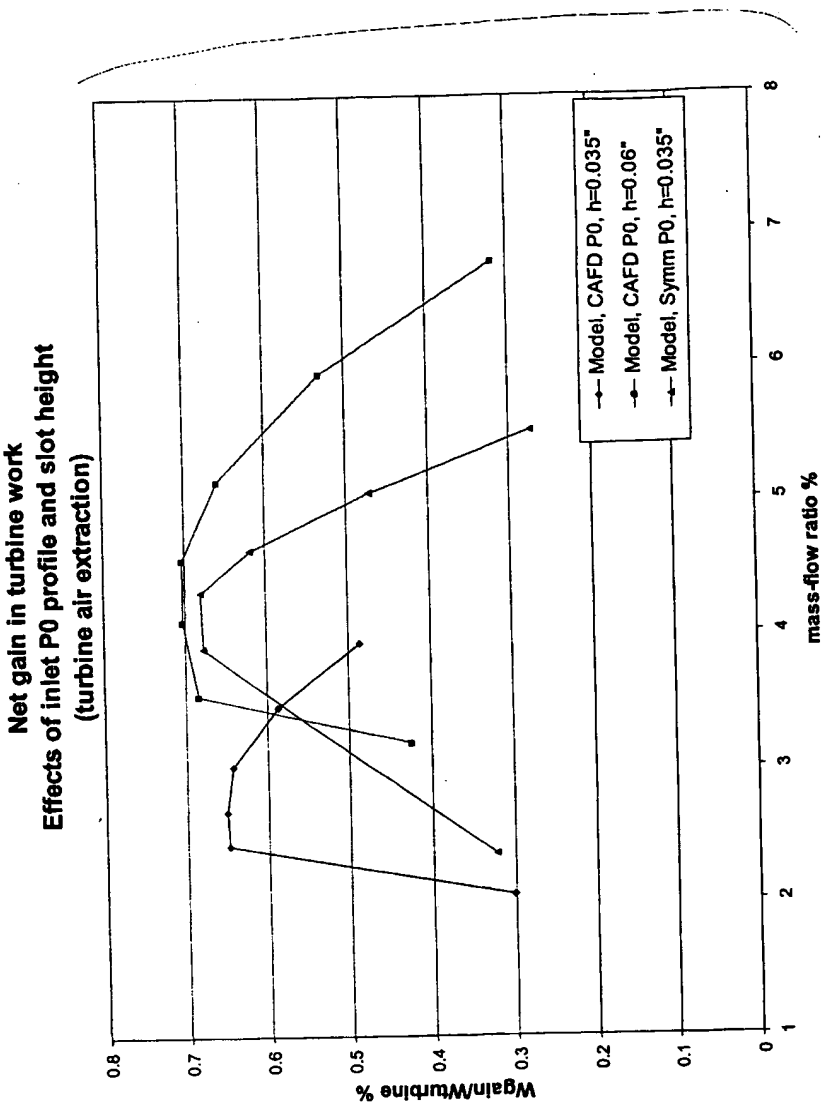


FIG. 12

BEST AVAILABLE COPY

- **Baseline turbine work**

$$W_b = \dot{m}C_p(T_0^i - T_0) = \dot{m}C_p T_0^i \left[1 - \left(\frac{P_0}{P_0^i}\right)^{e_i\frac{\gamma-1}{\gamma}}\right]$$

- **Augmented turbine work**

$$W_a = \dot{m}C_p(T_0^i - T_0') - \dot{m}_B C_p(T_0^B - T_0') = \dot{m}C_p T_0^i \left\{\left[1 - \left(\frac{P_0'}{P_0^i}\right)^{e_i\frac{\gamma-1}{\gamma}}\right] - \frac{\dot{m}_B}{\dot{m}}\left(\frac{P_0^B}{P_0^i}\right)^{e_i\frac{\gamma-1}{\gamma}}\left[1 - \left(\frac{P_0'}{P_0^B}\right)^{e_i\frac{\gamma-1}{\gamma}}\right]\right\}$$

- **Net turbine work gain (figure of merit)**

$$\frac{W_{gain}}{W_{turbine}} = \frac{W_a - W_b}{W_b}$$

FIG. 13

BEST AVAILABLE COPY

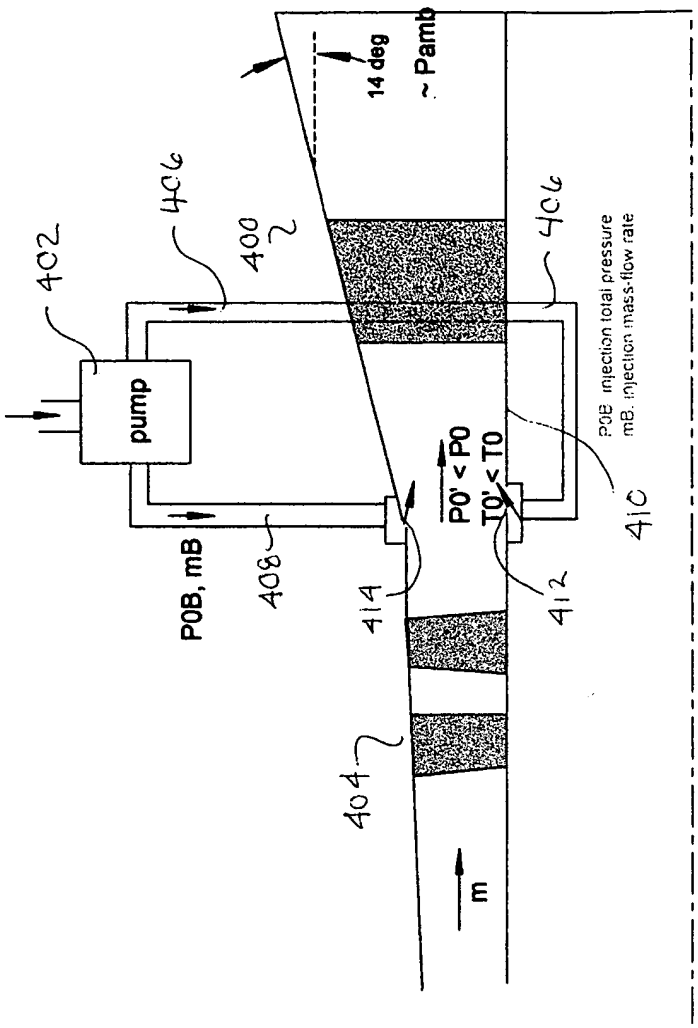


Fig. 14

BEST AVAILABLE COPY

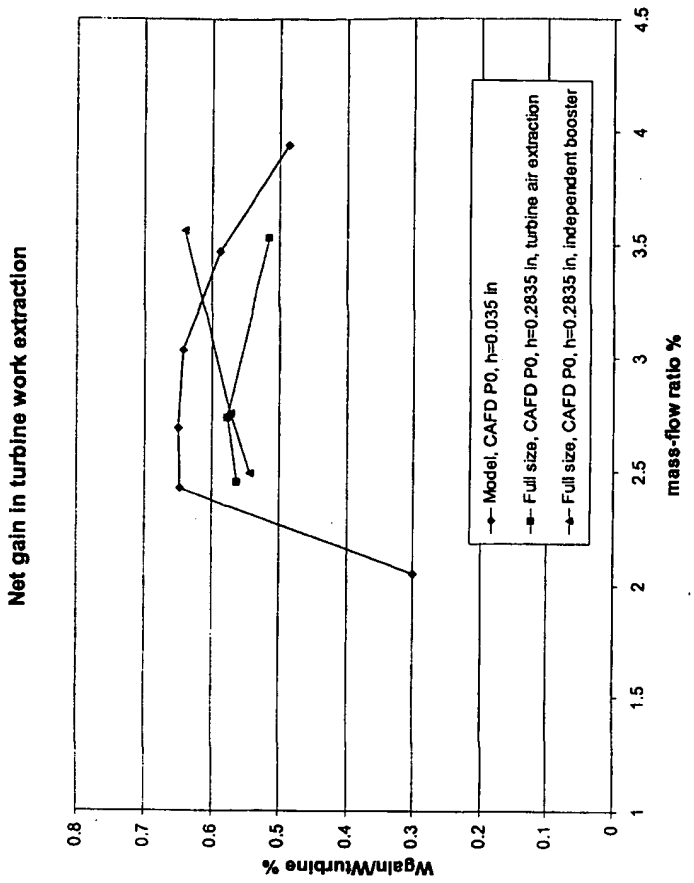


FIG. 15

BEST AVAILABLE COPY

- **Baseline turbine work**

$$W_b = \dot{m}C_p(T_0^i - T_0) = \dot{m}C_p T_0^i \left[1 - \left(\frac{P_0}{P_0^i}\right)^{e_t \frac{\gamma-1}{\gamma}}\right]$$

- **Augmented turbine work**

$$W_a = \dot{m}C_p(T_0^i - T_0') = \dot{m}C_p T_0^i \left[1 - \left(\frac{P_0'}{P_0^i}\right)^{e_t \frac{\gamma-1}{\gamma}}\right]$$

- **Blowing work (booster)**

$$W_B = \dot{m}_B C_p'(T_0^B - T_{amb}) = \dot{m}_B C_p' T_{amb} \left[\left(\frac{P_0^B}{P_{amb}}\right)^{\frac{\gamma'-1}{\gamma' e_c}} - 1\right]$$

- **Net turbine work gain (figure of merit)**

$$\frac{W_{gain}}{W_{turbine}} = \frac{W_a - W_B - W_b}{W_b}$$

FIG. 16

BEST AVAILABLE COPY

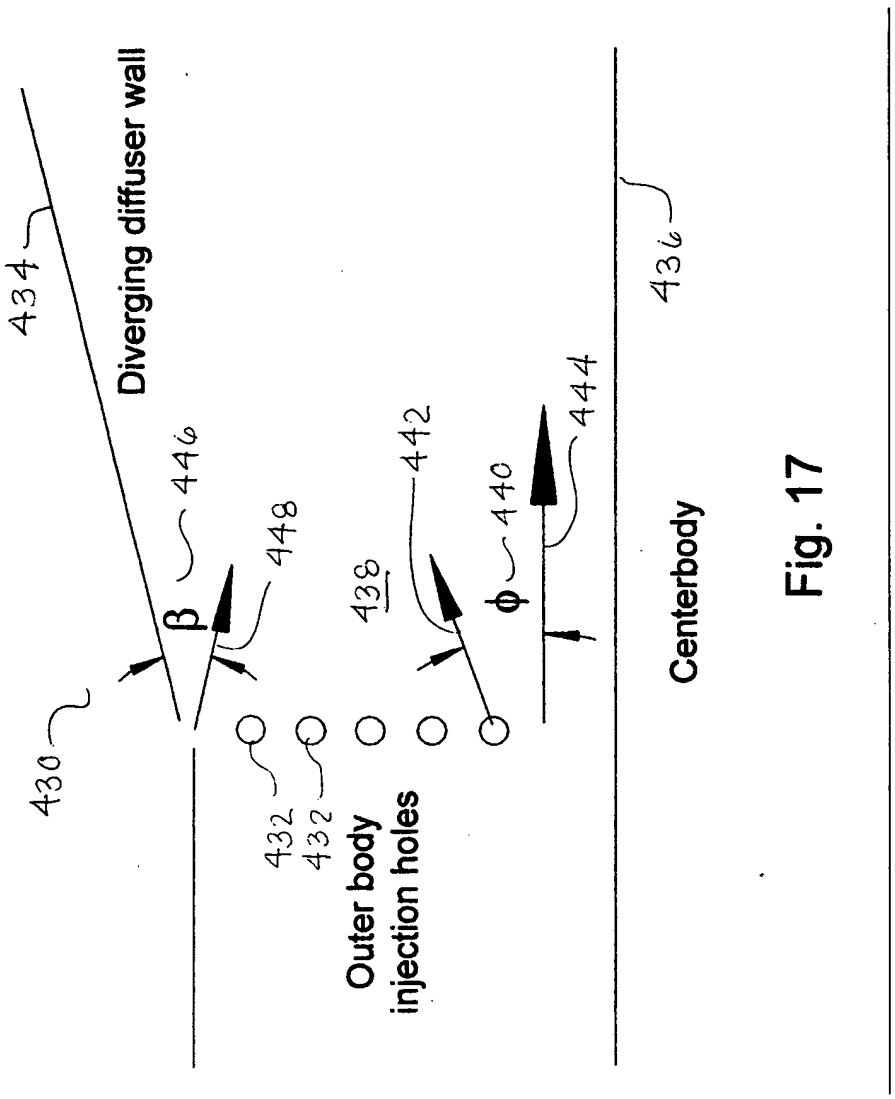


Fig. 17

BEST AVAILABLE COPY

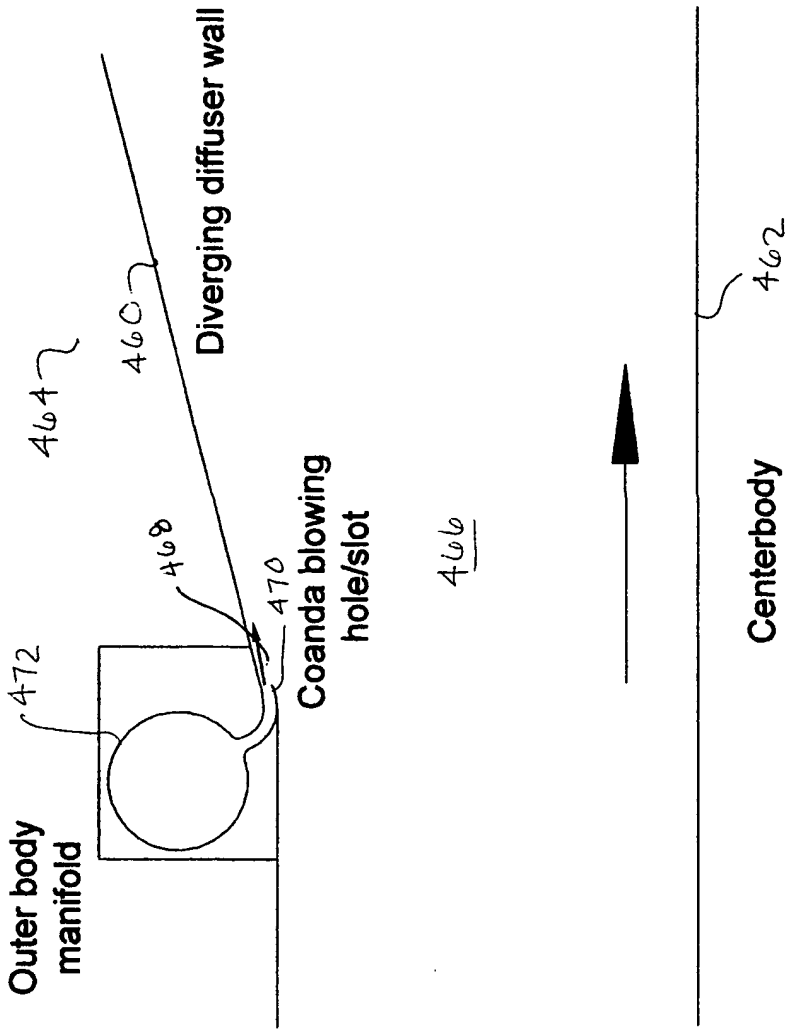


Fig. 18

BEST AVAILABLE COPY

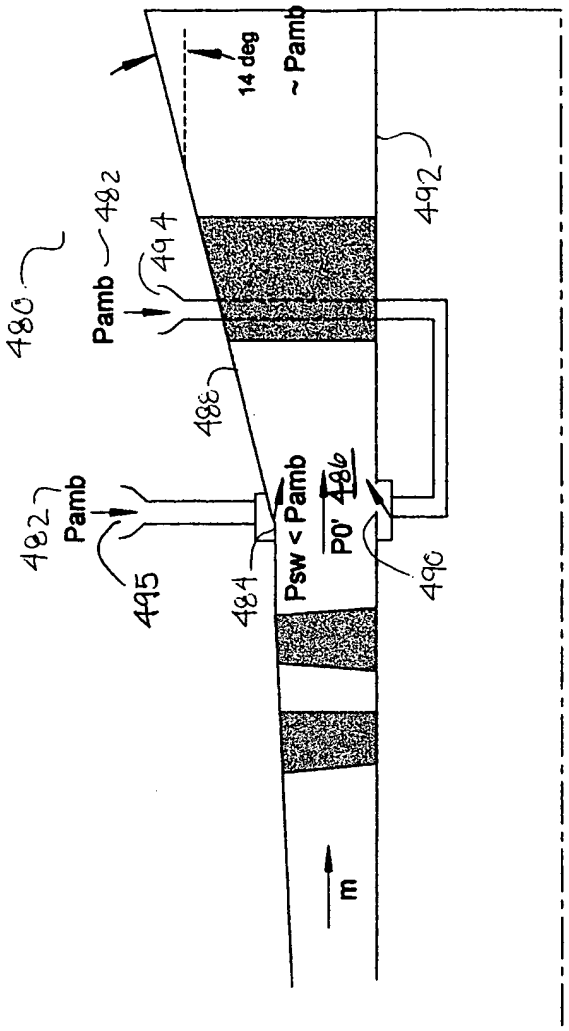


Fig. 19

BEST AVAILABLE COPY

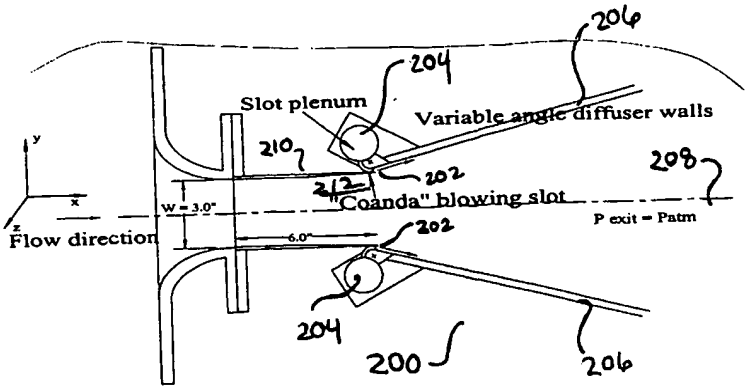


FIG. 20

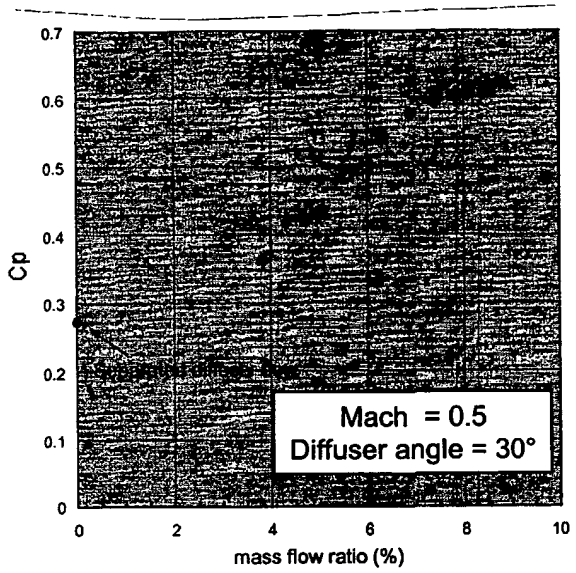


FIG. 21

BEST AVAILABLE COPY

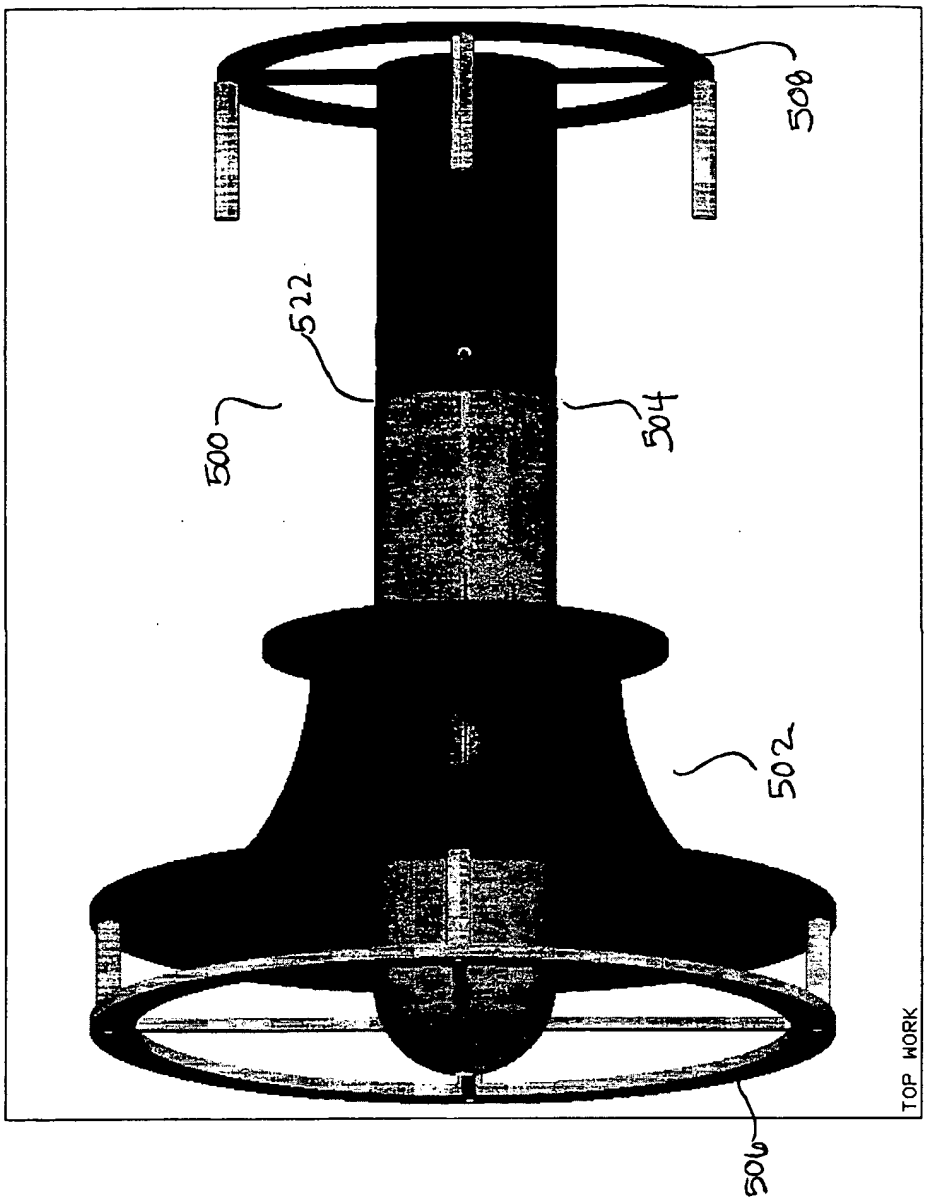


FIG. 22

BEST AVAILABLE COPY

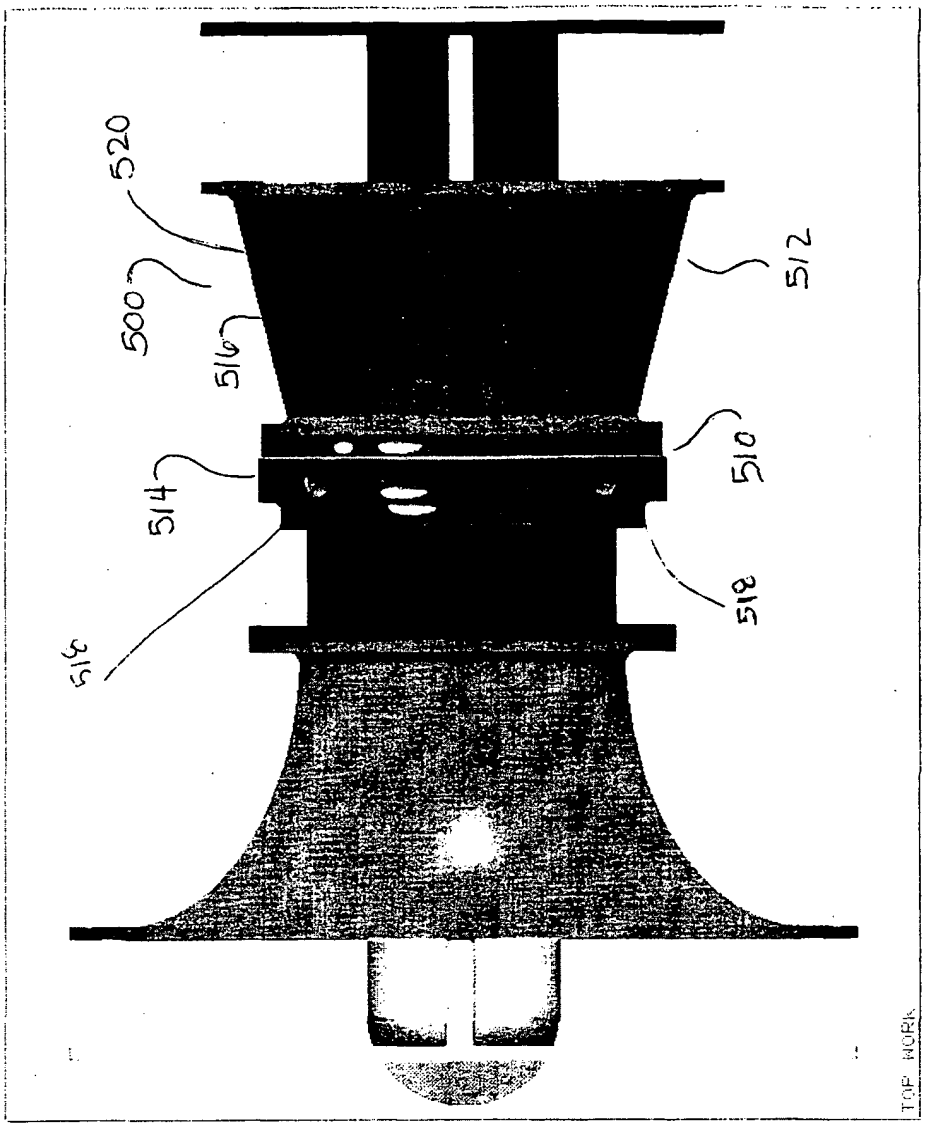


FIG. 23

BEST AVAILABLE COPY

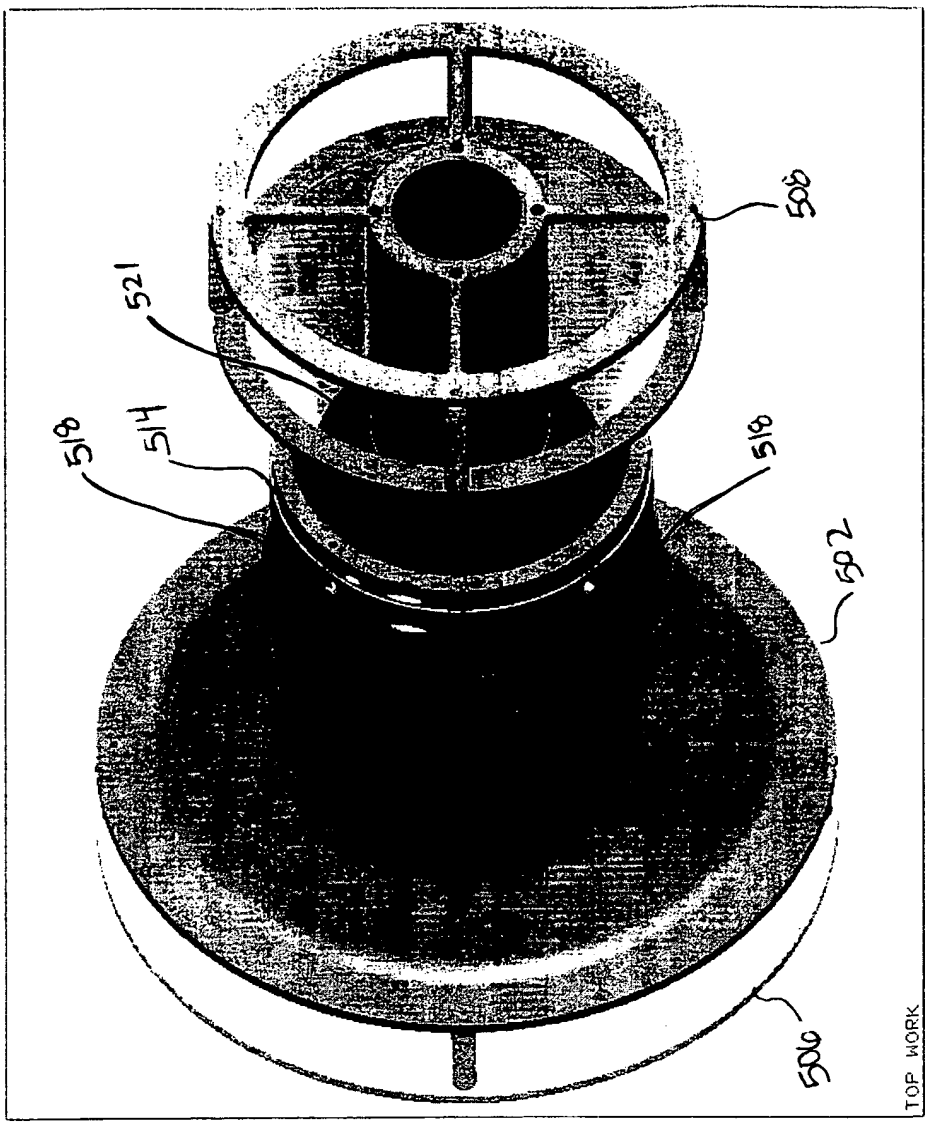


FIG. 24

BEST AVAILABLE COPY

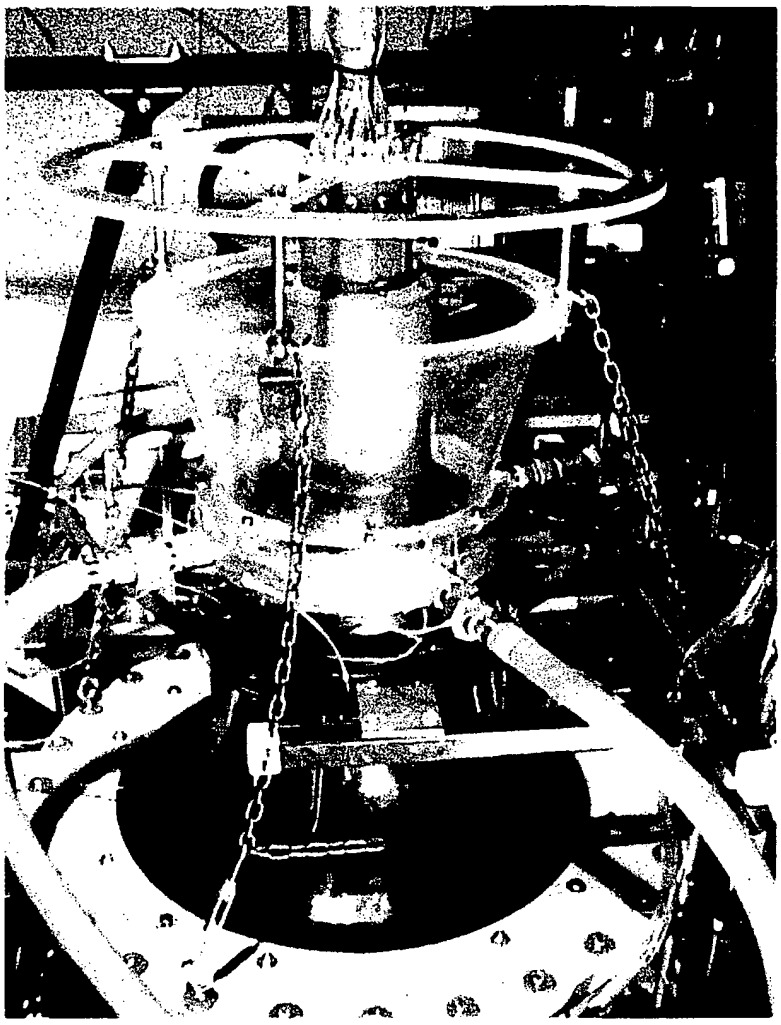


Fig. 25

BEST AVAILABLE COPY

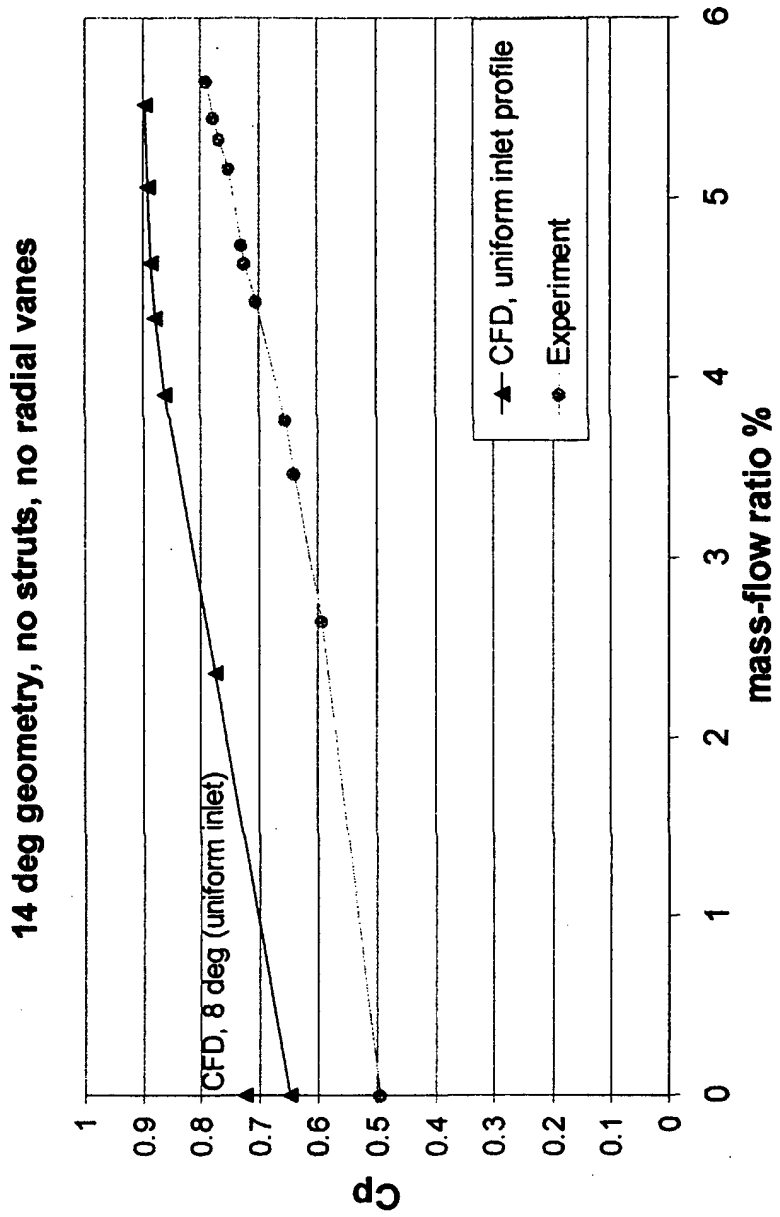
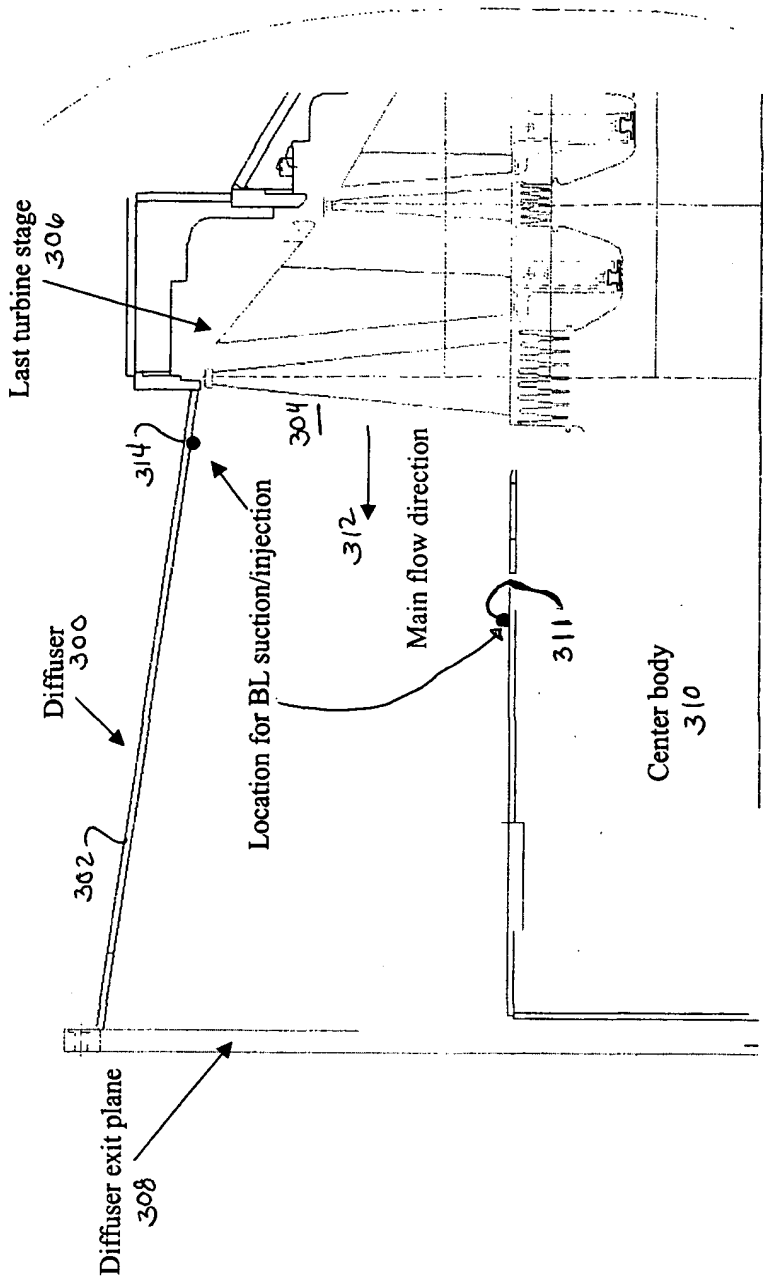


Fig. 26

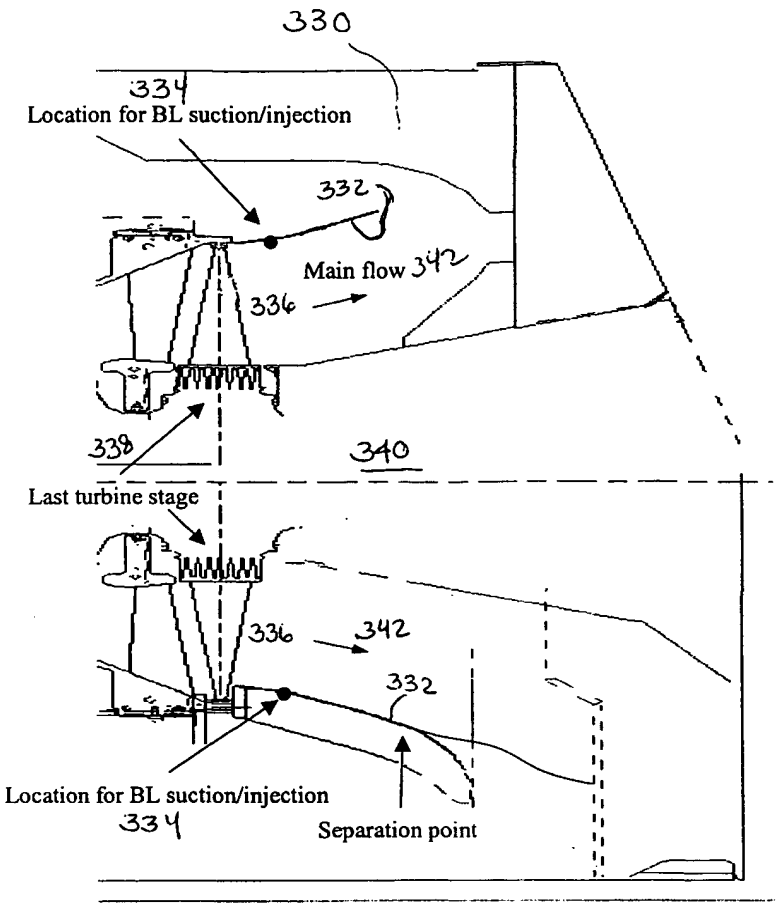
BEST AVAILABLE COPY



Schematic of ST Axial-Flow Diffuser - A10

FIG. 27

BEST AVAILABLE COPY



Schematic of ST 33.5 Down-Flow Exhaust Hood

FIG. 28

BEST AVAILABLE COPY